REMARKS

Enclosed is a petition for an extension of time and the appropriate fee.

The Office Action rejected Claims 3, 7, 11, 15, and 18 under 35 U.S.C. 112 as being indefinite. Applicant respectfully traverses this rejection in its entirety.

Dependent Claim 3 is amended to recite the needle electrode is pointed at the distal end, and that the acute angle refers to the angle made by the sloping portion forming the point of the needle with the longitudinal axis of the needle itself (Specification Fig. 1 and page 5 ll. 4-6). Claims 7, 11, 15, and 18 depend directly or indirectly from dependent Claim 3.

The Office Action rejected Claims 5-8 under 35 U.S.C. 112 as not enabling one skilled in the art to make and use the invention. Claims 5-8 merely recite the variability of the amount of n gative ions emitted as depending on the load resistance as a circuit parameter (Specification page 3 ll. 14-16). It is well known in the art that to vary a load resistance will have an effect on the circuit. The load resistance section acts as a pressure unit and enables the build up of electrical pressure, or electrical potential (Specification page 8 ll. 17-19). Although the amount of variation is not claimed, it would not require undue experimentation to determine a useful amount of variation about the preferred embodiment operating point of 20 Ω (Specification page 7 ll. 2-5). In fact, the method to confirm whether an amount of variation is useful to emit negative ions is clearly taught in the Specification. That method is to observe the luminescence of a fluorescent tube as it is approached by the apparatus of the present invention (Specification page 7 ll. 5-9).

Applicant respectfully requests this rejection be withdrawn.

The Office Action rejected Claims 1, 2 and 17 under 35 U.S.C. § 102(b) as being anticipated by *Fujisawa* (U.S. Patent No. 3,808,498). Applicant respectfully traverses this rejection in its entirety.

Claims 1 and 17 are amended to recite the discharge electrode section is connected at its proximal end to the DC high-voltage power supply section, and emits electrons from its distal end (Specification Fig. 1, page 3 ll. 14-16, and page 5 ll. 11-13).

The present invention teaches a method and apparatus for effectively emitting electrons or negative ions, without requiring any mechanism for absorbing ozone and positive ions, by electrically connecting a load resistance section arranged between a DC high-voltage power supply section and a discharge electrode section so as to restrict the flow of electrons from the DC high-voltage power supply section to the discharge electrode section (Specification page 2 line 26 to page 3 line 9). Note, the Amendment of November 8, 2002, page 4 erroneously described the discharge as a "corona" discharge. The discharge process of the present invention causes electrons to collect before the load resistance section until a predetermined level is reached, following which the collected electrons are forcibly expelled through the load resistance section causing electrons or negative ions to be emitted from the discharge electrode section into the atmosphere (Specification page 6 ll. 11-17). The DC high-voltage source of the preferred embodiment is a relatively low 5kV (Specification page 7 ll. 2-5).

Fujisawa teaches the emission of a high-resolution electron beam from a heated filament energized by an alternating current (AC) power source (Fujisawa col. 1 ll. 6-10 and col. 3 ll. 24-49). *Fujisawa* is addressing the problem of electron beam deflection caused by pockets of high

field intensity caused by field emission sources distributed on the surface of a specialized, blunt electrode forming a part of an electron gun assembly (Fujisawa col. 3 ll. 17-19, 43-50, and 60-67). Electrons are emitted by "boiling off" from the heated filament. In contrast, the present invention is drawn to emitting ions or negatively charged electrons incoherently into the atmosphere in a non-thermal manner from a discharge electrode section. *Fujisawa* teaches a very high-voltage DC source of 100kV to supply electrons for the high-resolution electron beam with the interior of the electron gun chamber being kept at a high vacuum (Fujisawa col. 3 ll. 53-55 and col. 2 ll. 6-10 and). These factors clearly distinguish the present invention from the *Fujisawa* reference.

Claims 1 and 17, as amended, teach a ion emitter that is functionally different from the cited reference based on the arguments outlined above, and are believed to be patentably distinct. Dependent Claim 2 depends from and further limits independent Claim 1.

Applicant respectfully requests this rejection be withdrawn.

The Office Action rejected Claims 4, 9-16, and 18-22 under 35 U.S.C. § 103(a) as unpatentable over *Fujisawa* in view of *Tsunoda et al* ("Tsunoda" U.S. Patent No. 5,536,944). Applicant respectfully traverses this rejection in its entirety.

On the subject of obviousness, Applicant respectfully invites attention to the following citation:

> Most if not all inventions arise from a combination of old elements . . . Thus, every element of a claimed invention may often be found in the prior art . . . However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention . . . Rather, to establish obviousness based on a combination of elements

> disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant . . . Even when obviousness is based on a single reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference . . . The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved . . .
>
> *In re Kotzab*, 55 USPQ2d, 1313 (Fed. Cir. 2000)

Tsunoda teaches a thermal field emission electron gun used for producing stable electron beams in a short time for an electron beam device such as a scanning electron microscope (Tsunoda col. 1 ll. 7-11 and 56-60). Similar in function to *Fujisawa*, *Tsunoda* teaches a heated tungsten filament for producing electrons (Tsunoda col. 2 line 66 to col. 3 line 1). The tungsten filament is heated to a very high temperature of 1500 degrees C (Tsunoda col. 2 ll. 9-11). The tungsten filament heats an electrically conductive needle which is inserted into a precisely dimensioned opening for emitting a controlled stream of electrons (Tsunoda col. 3 ll. 16-24 and ll. 41-45). The manner of generating electrons by boiling them off from a heated element is the same as that disclosed in Fujisawa and in contrast with the present invention. The use of a needle in *Tsunoda* is to precisely control the admission of free electrons through a blunt suppressor electrode (Tsunoda col. 3 ll. 16-24). Although *Fujisawa* and *Tsunoda* utilize similar terminology, the method of producing electrons, and the manner of release are very different. Both *Fujisawa* and *Tsunoda* describe a thermal emission method based on heating of a filament. The present invention is forcibly ejecting negative ions in a non-thermal manner.

Claim 21 is amended to recite the emission of negative ions occurs when the predetermined voltage is achieved, and the negative ions are released in a non-thermal manner.

Claims 4, 9-16, and 18-22 teach an apparatus and method for emitting ions or negatively charged electrons into the atmosphere using in a by performing a different function, in a different way, and with a different result from the cited references and is drawn to a different application.

Applicant respectfully submits that *Fujisawa* and *Tsunoda*, even if combined as suggested, do not teach or suggest all the limitations of the present invention.

In summary, the thermal field emission electron gun of *Tsunoda* is also used for the same purpose as that of *Fujisawa*. That is, for generating an electron beam in an electron microscope or similar instrument. The filament of *Tsunoda* is connected at the opposite ends of metallic supports and corresponds to the filament of *Fujisawa*. Although in *Tsunoda* the tungsten needle is attached to the filament, the manner of generating electrons by the filament is the same as in *Fujisawa*. As discussed above, the combination of the teachings of *Fujisawa* and *Tsunoda* does not teach or suggest the claimed features of Claims 1 and 17 of the present invention, and thus, does not suggest the corresponding dependent Claims 4, 9-16, and 18-19. Similarly, the claimed features of Claims 20-22 of the present invention are neither taught nor suggested by the combination of *Fujisawa* and *Tsunoda*.

Applicant respectfully requests that this rejection be withdrawn.

OFFICIAL

CONCLUSION

It is believed that all claims are in condition for allowance, and an early notification of the same is requested.

If the Examiner believes that a telephone interview will help further the prosecution of this case, he is respectfully requested to contact the undersigned attorney at the listed telephone number.

I hereby certify that this document and fee is being deposited on August 4, 2003 with the U.S. Postal Service as first class mail under 37 C.F.R. §1.8 and is addressed to Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450.

by: James Lee

Signature

Date of Signature: August 4, 2003

Respectfully submitted,

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